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TITLE: Direct Test for Neuroinflammation with [11C]DAP-713-PET Scanning

PRINCIPAL INVESTIGATOR: Martin Pomper

CONTRACTING ORGANIZATION: Johns Hopkins University
Baltimore, MD 21218

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14. ABSTRACT
This project concerns the non-invasive detection of inflammation in the brains of individuals suffering from the Gulf War Illness (GWI). We are using quantitative positron emission tomography (PET) using [11C]DPA-713 (DPA). DPA binds to the translocator protein (TSPO), which is located on the outer mitochondrial membrane and is an established biomarker of neuroinflammation. The study intends to enroll 10 patients and 10 appropriately matched healthy control subjects. The study is a collaboration between Johns Hopkins University and the University of Texas Southwestern Medical Center, where a carefully vetted population of individuals with GWI exists. PET imaging will be undertaken at Johns Hopkins.

15. SUBJECT TERMS
molecular imaging; PET; Gulf War Illness; DPA-713; distribution volume; neuroinflammation

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1. **INTRODUCTION:** This project concerns the non-invasive detection of inflammation in the brains of individuals suffering from the Gulf War Illness (GWI). We are using quantitative positron emission tomography (PET) using [^{11}C]DPA-713 (DPA). DPA binds to the translocator protein (TSPO), which is located on the outer mitochondrial membrane and is an established biomarker of neuroinflammation. The study intends to enroll 10 patients and 10 appropriately matched healthy control subjects. The study is a collaboration between Johns Hopkins University and the University of Texas Southwestern Medical Center, where a carefully vetted population of individuals with GWI exists. PET imaging will be undertaken at Johns Hopkins.
2. **KEYWORDS:** molecular imaging; PET; Gulf War Illness; DPA-713; distribution volume; neuroinflammation
3. **ACCOMPLISHMENTS:**
    - **What were the major goals of the project?**
        - To identify, contact, and screen subjects for study.
        - To perform [^{11}C]DPA-713 PET to study neuroinflammation in GWI and controls.
    - **What was accomplished under these goals?**
4. Since our approval for recruitment on August 4, 2015 our recruitment is on target and we are actively screening potential participants. To date, we have enrolled one study participant, who tolerated the study procedures well and report no adverse events. Analysis of that scan and blood genotyping revealed that this initial subject had the T/T genotype, which is associated with < 10% of patients sampled. It is also associated with relative insensitivity to imaging with second-generation TSPO-targeted imaging agents, such as DPA. Recruitment is ongoing.
    - **What opportunities for training and professional development has the project provided?**
        - Although not necessarily intended for this purpose, the project will prove instrumental in the professional development of Dr. Il Minn, currently an instructor in radiology, who will be proposed soon for assistant professor. Furthermore, Dr. Minn has engaged two technicians whom he has trained in the cloning and other studies necessary to undertake the genotyping aspects of this work.
    - **How were the results disseminated to communities of interest?**
        - Nothing to report at the present time.
    - **What do you plan to do during the next reporting period to accomplish the goals?**
        - We intend to complete recruitment, imaging and analysis. Since we are quite familiar with the radiotracer being used, we anticipate that once recruitment is completed the remainder of the study will proceed smoothly.
5. **IMPACT:**
    - **What was the impact on the development of the principal discipline(s) of the project?**
        - This is the first project to study neuroinflammation in this patient cohort.
    - **What was the impact on other disciplines?**
        - Nothing to report at this time as we have not yet published.

- **What was the impact on technology transfer?**
  - Nothing to report at this time.
- **What was the impact on society beyond science and technology?**
  - Nothing to report at this time.

6. **CHANGES/PROBLEMS:** Nothing to report
7. **PRODUCTS:** Nothing to report – These items will be reported once finished with the project and publications are submitted.
8. **PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS**
   - **What individuals have worked on the project?**
     - No change
   - **Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?**
     - Martin Pomper

Ended

Title: PSMA-Based Cancer Imaging Agents
Time Commitments: 0.24 calendar months
Supporting Agency: NCI, R01CA134675 (NCE)
Grants Contact: Barbara Croft (301) 496-9531 E-Mail: croftb@mail.nih.gov
PI: Martin Pomper
Performance Period: 4/1/2009-2/28/2015
Level of Funding: $159,199
Description of Goals: Prostate cancer (PCa) is the leading cancer in the U.S. population and the second leading cause of cancer death in men (16). Therapy for locally advanced disease remains contentious and an increasing number of disparate options are available. Perhaps the most pressing issue in PCa management is the need to predict, at the time of diagnosis, which tumors will remain indolent and which will progress rapidly. The ability to fulfill that goal would eliminate the prostate-specific antigen (PSA)-mediated over detection and overtreatment of clinically insignificant disease.
Aim #1: Synthesis and evaluation of a series of PET imaging agents for PSMA.
Aim #2: Synthetic optimization of the best compounds of Aim 1 en route to GMP and/or facilitated use.
Aim #3: Synthesis and evaluation of a series of homo- and heterodimeric imaging agents for PSMA.

Title: BETR Therapy of Herpesvirus-associated Tumors
Time Commitments: 1.09 calendar months
Supporting Agency: NCI, NIH R01CA138636
Grants Contact: Jason Gill (301) 496-7240 E-Mail:gilljas@mail.nih.gov
PI: Martin Pomper
Performance Period: 04/01/10-02/28/15
Level of Funding: $322,099
Description of Goals: The purpose is to treat gammaherpesvirus-associated tumors with [131]FIAU in human subjects
Aim #1: To perform a first-in-man, FIAU-PET image-guided, BETR study in patients with EBV-associated malignancies.

Aim #2: To assess parameters that will aid in the optimization of therapy.

Title: TK-based Infection Imaging
Time Commitments: 0.24 calendar months
Supporting Agency: NIH, NIBIB R01EB009367 (NCE)
Grants Contact: Florence Turska (301) 496-9314 E-Mail:ft7p@nih.gov
PI: Martin Pomper
Performance Period: 05/15/10-04/30/15
Level of Funding: $267,740
Description of Goals: The goal is to study further musculoskeletal infection, comparing a newly developed method in infection imaging to the current clinical standard of tagged white blood cell (WBC) and attempting to determine the sensitivity and specificity of our technique.
Aim #1: Estimate the sensitivity and specificity of FIAU-PET in detecting orthopedic infection.
Aim #2: To extend the FIAU imaging technique to pulmonary infection.
Aim #3: To transition from [124I]FIAU to [18F]FIAU for imaging bacterial infection.

Title: Precision Measurement in Rheumatoid Arthritis
Time commitments: 0.09 calendar months
Supporting Agency: Sibley Hospital 90048894 (NCE)
Grants Contact: Robert L. Sloan, President and CEO; 5255 Loughboro Rd, N.W., Washington DC 20016; 202-537-4680
PI: Rosen
Role: Co-Investigator
Performance Periond: 11/1/2011-10/31/2014
Level of Funding: $600,035
Description of Goals: The long term goal of this aim is to improve the utility of MR imaging in evaluation of RA
Aim 1: A graded approach, extending from basic studies to those with an obvious pathway to clinical translation by providing the following specific aims, which focus on molecular imaging.
Aim 2: A graded approach, extending from basic studies to those with an obvious pathway to clinical translation by providing the following specific aims, which focus on high-field magnetic resonance (MR) (Aim 2) imaging.

Title: Molecular Imaging for Macrophage-Associated Pulmonary Inflammation
Time commitments: 0.36 calendar months
Supporting Agency: NIH/NHLBI 1R01HL116316
Grants Contact: Kimberly Stanton, (301) 435-0519, E-Mail stantonk@nhlbi.nih.gov
PI: Sanjay Jain
Performance Period 9/25/2012- 6/30/2015
Level of Funding: $238,000
Role: Co-Investigator

Description of Goals: The overall goal is to have a fully validated probe ready for human administration and to file a FDA Investigational New Drug (IND) application at the end of the funding period.
Aim 1: To evaluate [125/4I]DPA-713-SPECT/ PET as a biomarker for serial monitoring of macrophageassociated pulmonary inflammation.
Aim 2: To perform cGMP synthesis and toxicology studies for iodo-DPA-713.
Aim 3: To quantify and correlate lesion-specific, multi-modality image parameters across differenttime-points using in-house computer-assisted image analysis tools.

Title: Extrathalamic nAChR-PET for Imaging Neurodegeneration
Time Commitments: 0.46 calendar months
Supporting Agency: NIHR33AG037298
Grants Contact: Jessica Perez, 301-496-1472, E-Mail: perezj@nia.nih.gov
PI: Andrew Horti
Role: Co-Investigator
Performance Period: 03/1/2011-8/31/2015
Level of Funding: $249,274
Description of Goals: The goal is to develop a new nicotinic receptor-based PET agent that enables imaging of extrathalamic sites.
Aim 1, R21. To develop a method of synthesis of sufficient quantities (100-300 mg) of precursor (-)JHU87571 for radiolabeling of [18F]XTRA for 100 radiosyntheses.
Aim 2, R21. To evaluate [18F]XTRA in mice. (a) To confirm that in vivo [18F]XTRA binds at nAChR selectively and specifically. (b) To show that the radioactive metabolites are not present in the mouse brain. (c) To carry out radiation dosimetry studies in mice for an eIND application.
Aim 3, R21. To characterize [18F]XTRA in baboon PET studies. (a) To confirm that the high nAChR binding potentials in cortex, hippocampus and putamen (BP $\geq$ 1.1) and optimally rapid brain kinetics were not unique to the single experiment of the Preliminary studies.

Title: Multi-Color Exchange Transfer Imaging of Drug Delivery Nanocarriers
Time Commitments: 0.09 calendar months
Supporting Agency: NIH R01EB01531
Grants Contact: Guoying Liu, 301-594-5220, E-Mail: liug@mail.nih.gov
PI: Michael McMahon
Role: Co-Investigator
Performance Period: 8/1/2011-6/30/2015
Level of Funding: $439,205
Description of Goals: This proposal is focused on the production of carriers for cervical tumor drugs which are labeled with DIACEST contrast agents for MRI monitoring.
Aim #1: To design a library of peptide-based DIACEST contrast agents suitable for incorporation into biodegradable particles
Aim #2: To design CEST drug carriers optimized for systemic nanoparticle-based chemotherapy
Aim #3: (A) To design CEST drug carriers optimized for local nanoparticle-based chemotherapy. (B) To test imaging after local and systemic administration.

New

Title: PSMA Directed Imaging of Prostate Cancer Focus on Androgen Receptor Dynamics
Time Commitments: 1.35
Supporting Agency: NIH/NCI U01CA183031
Grants Contacts: Yantian Zhang; Program Official; 240-276-5980; Yantian.zhang@nih.gov
PIs: Pomper/Deweese
Performance Period: 11/01/2014-10/31/2016
Level of Funding: $496,642
Description of Goals: The overall goal is to validate at least two positron-emitting, PSMA-targeted imaging agents clinically so that they can be used to full advantage in supporting existing and emerging therapies for a spectrum of patients suffering from PCa.
Aim 1. To image treatment-naïve patients with localized-locally advanced primary PCa using DCFBC-PET/magnetic resonance imaging, and correlate signal with that on MR concurrently obtained, as well as with tumor grade, PSMA expression and androgen receptor (AR) signaling before and after two months of neoadjuvant androgen deprivation (ADT).
Aim 2. To image patients with CRPC using DCFBC-PET/MR and correlate findings with bone and soft tissue biopsy.
Aim 3. To image patients with CRPC with DCFBC-PET/MR and correlate with standard 99mTc-based bone scan to guide stereotactic body radiation treatment (SBRT) in patients with oligometastatic disease.
Aim 4. Imaging CRPC with the second-generation, PSMA-targeted PET agent, [18F]DCFPyL.

Title: High-Specificity Imaging Agents for Aggressive Prostate Cancer
Time commitments: 1.35 calendar months
Supporting Agency: NIH/NCI (Renewal) R01CA134675
Grants Contact: Leota Hall; Program Official; 240-276-6449; halle@gmail.nih.gov
PI: Pomper
Performance Period: 12/1/2014-11/30/2019
Level of Funding: $443,885
Description of Goals: The goals of this project are to leverage existing but untested agents and to develop new agents for imaging PC, with a focus on aggressive, localized disease.
Aim 1: Imaging of patients with biopsy-proved primary PC with DCFPyL-PET with subsequent correlation of PET signal with histopathology at prostatectomy for PSMA expression, Gleason score and other markers
Aim 2: Synthesis of select PSMA-targeted imaging agents that (a) encompass a new scaffold to engender superior affinity and pharmacokinetics; (b) are hetero-bivalent (HtBv), homing to a rationally chosen co-target (in addition to PSMA); or, (3) enable detection with MR through signal amplification
Aim 3: Development and testing of new agents for imaging the PC microenvironment

Title: Direct Test for Neuroinflammation with [11C]DPA-713-PET Scanning
Time commitments: 1.20 calendar months
Supporting Agency: DoD W81XWH-14-1-0620
Grants Contact: Kathy Robinson, GWIRP Grants Officer; 820 Chandler St, Fort Detrick MD 21702

PI: Pomper
Period of Performance: 07/01/2014-06/30/2019
Level of Funding: $389,978
Description of Goals: This project concerns measuring two key neurological aspects of Gulf War Illness (GWI), namely, neuroinflammation and dysregulation of muscarinic cholinergic transmission.
Aim 1. To assess the degree of microglial activation in the brains of former Gulf War veterans who suffer from GWI through [11C]DPA-713 PET.

Title: Bipolar Androgen Therapy: Breaking out of the Chrysalis of Chronic Androgen Deprivation Therapy in Men with Late-Stage Castrate Resistant Prostate Cancer
Time commitments: 0.12 calendar months
Supporting Agency: CDMRP
Grants Contact: TBD
PI: Denmeade
Co-Investigator: Pomper
Performance Period: 09/1/2014-08/31/2017
Level of Funding: $1,669,328
Aim 1: The major objective is to demonstrate the superiority of BAT vs. Enza in asymptomatic men with metastatic CRPC progressing after ADT and Abi, by performing a multi-institutional, open-label, randomized study, using radiographic progression-free survival (rPFS) as the primary endpoint.
Aim 2: Evaluate the effect of BAT on the uptake of FDHT and PSMA inhibitor-based PET agents in metastatic sites.
Aim 3: Evaluate regulation of AR splice variants in circulating tumor cells (CTCs) in response to therapy.
Aim 4. Analyze circulating tumor DNA to determine the effect of individual therapies on emergence of AR mutations.

- Robert W. Haley

Ended
Title: UT Southwestern Clinical and Translational Alliance for Research (UT-STAR)
Grant Number / PI: TR000451-06 / Toto, Robert D.
Time commitment / Role: 0.60 calendar months / Co-Investigator
Supporting agency: NIH/NCRR
Contacts: Tiffany Walker, (301) 435-0839, Email: walkerti@mail.nih.gov
Performance period: 06/01/12 – 05/31/13
Level of funding: $4,618,151
Description of Goals: The major goal of this grant is to provide the crucial infrastructure necessary for medical scientists to discover and apply new diagnostics and therapeutics for the detection, diagnosis, treatment and prevention of disease, and thereby achieve the goal of improving our nation's health in a safe, ethical and responsible manner that ensures the individual's well-being and the public's trust.
Aim 1: Transform the BERD KF to a single point of access for biostatistics, clinical research ethics, and research design to meet the increasingly complex demands of clinical and

translational research, to collaborate on the development of all study protocols, and to provide necessary biostatistical, epidemiologic, and ethics support during the conduct of the studies
Aim 2: Educate and train investigators in biostatistics, clinical research ethics, and research design by adapting and expanding current curriculum for clinical and translational research.
Aim 3: Grow novel research collaborations out of consultation and educational services and develop innovative statistical methods, designs, and research ethics policies/procedures to facilitate and expand clinical and translational research in the UT-STAR community and beyond.
Aim 4: Integrate the BERD KF with other KFs and collaborate with Texas Regional and National BERD consortiums.

Title: Integrating Multimodal Brain Imaging Data to Assess Subtle Cognitive Impairment
Grant Number / PI: 1-R21-EB014563-01 / Spence, Jeffrey
Time commitment / Role: 0.36 calendar months / Co-Investigator
Supporting agency: NIBIB
Contact: Angelos Bacas, (301) 451-4785, Email: ab329b@nih.gov
Performance period: 04/01/2012 – 03/31/2014 (no cost extension pending)
Level of funding: $135,708
Description of Goals: The primary goal of this research is to develop a novel analytic framework, based on spatial modeling, to improve the ability to measure subtle changes in brain states that can occur in the pathology of cognitive impairment due to degenerative diseases, traumatic brain injury, adjuvant chemotherapy and other exposure-related illnesses. Achieving this goal may suggest treatments to alleviate symptoms, prevent progression, or at minimum, provide an informed clinical management strategy
Aim 1: Extending spatial modeling methodology to BOLD fMRI and EEG power spectra
Aim 2: Deriving a kriging-based ICA approach for defining functional brain networks
Aim 3: Integrating imaging modalities by the construction of statistical classifiers based on derived sets of features defined in the first two aims.

Title: Abnormalities in Human Brain Creatine Metabolism in Gulf War Illness Probed with MRS
Grant Number / PI: GW110034 / Briggs, Richard
Time Commitment / Role: 0.6 calendar months / Co-Investigator
Supporting Agency: US Department of Defense
Grants Officer: Kathy E. Robinson, 301-619-4018, Email: kathy.robinson@us.army.mil
Performance Period: 09/30/2012 – 09/29/2014
Level of Funding: $259,619 (year 1 D.C.)
Description of Goals: The primary goal of this research is to investigate creatine metabolism in brains of Gulf War Illness veterans by estimating amounts of phosphocreatine (PCr) and free creatine (Cr) using 31P and 1H magnetic resonance spectroscopy (MRS). Secondary goals are to measure individual 1H T2 relaxation times of the methyl resonances of PCr and Cr and to measure amounts of adenosine triphosphate (ATP) and inorganic phosphate (Pi) as well as to estimate intracellular pH and magnesium ion ($Mg2+$) concentrations from 31P MRS data.

Aim 1: To acquire and analyze localized 1H MRS data of right basal ganglia with multiple TE values sufficient to individually estimate the intensities and T2 values of the methyl resonances of PCr and Cr in four groups of Gulf War veterans (healthy controls and Haley Syndromes 1, 2, and 3).
Aim 2:To acquire and analyze localized 31P MRS data of basal ganglia and white matter (centrum semiovale) in four groups of Gulf War veterans (healthy controls and Haley Syndromes 1, 2, and 3) for estimation of amounts of PCr, adenosine triphosphate (ATP), and inorganic phosphate (Pi).

Title: Genomewide Association Study of a Validated Case Definition of Gulf War Illness in a Population-Representative Sample
Grant Number / PI: GW100073 / Robert W. Haley, MD
Time Commitment / Role: 1.2 calendar mo./ Principal Investigator
Supporting Agency: DoD/CDMRP/GWIRP
Grants Officer: Jennifer Shankle, 301-619-2193, E-mail: jennifer.shankle@amedd.army.mil
Performance Period: 1 Sept 2011 – 30 Aug 2013
Level of Funding: $140,357
Description of Goals: The objective is to measure genome-wide RNA gene expression with next generation RNA sequencing (RNA-seq) on approximately 150 ill Gulf War veterans selected from a national survey in a random sample of Gulf War veterans, meeting a validated case definition of Gulf War illness and controls, and thoroughly phenotyped with extensive brain imaging, EEG, and clinical studies. The goal is to identify patterns of gene expression that clearly differentiate the three variants of Gulf War illness and controls that can be used to define an objective diagnostic test and new clues to pathogenesis and treatment.
Aim 1: Perform gene expression profiling and group comparison analyses of differential gene expression in RNA-stabilized blood samples of the approximately 150 veterans meeting the Factor case definition and Gulf War-era veteran controls.

Title: Gulf War Veterans' Illness Research Program
Grant Number / PI: IDIQ Contract VA549-P-0027 / Robert W. Haley, MD
Time Commitment / Role: 70% / Program Director
Supporting Agency: Department of Veterans Affairs
Grants Officer: Vanessa Morton
Performance Period: 14 Nov 2006 – 1 June 2010
Level of Funding: $33.5 million
Description of Goals: The fundamental goal of Gulf War Veterans' Illnesses research is to ultimately improve the health of ill Gulf War Veterans. To this end, UTSWMC shall conduct and manage research projects supported by task orders awarded against this contract. The research will answer central questions on the nature, causes and treatments of Gulf War Veterans' Illnesses.
Aim 1: Perform a national survey of Gulf War-era veterans to estimate the prevalence of Gulf War illness (GWI) in deployed and nondeployed populations and provide a representative sample for further studies
Aim 2: Develop high throughput methods for measuring paraoxonase-1 isoenzymes and perform studies on its role in the pathogenesis of GWI

Aim 3: Perform multiple neuroimaging, EEG and neuropsychological testing protocols on a representative sample of Gulf War-era veterans; and 4) Perform pre-clinical experimental studies on the mechanisms by which cholinesterase-inhibiting chemicals cause chronic brain dysfunction.

New
Title: Evaluating Re-active Surveillance Strategies for Malaria Elimination
Time Commitment / Role: 0% / Mentor (Michelle Hsiang, PI))
Grant Number: 7 K23 AI101012-04
Supporting Agency: NIH
Grants Officer: Malla Rao, DRPH, malla.rao@nih.gov
Period of Performance: 6/1/2015 – 5/31/2016
Level of Funding: $243,500
Description of Goals: utilize a cluster randomized controlled study design to compare the effectiveness to interrupt malaria transmission of Targeted Parasite Elimination and Reactive Case Detection in reaction to a passive identified index case.
Aim 1: Primary Aim. To compare the impact of TPE versus RACD on cumulative incidence of malaria cases.
Aim 2: To compare the impact of TPE versus RACD on malaria seroprevalence, malaria infection prevalence, ratio of imported to local malaria infections, and time to first incident local case after intervention.

Title: Direct Test for Neuroinflammation with [11C]DPA-713-PET Scanning
Time Commitment / Role: 1.20 calendar months / Co-Investigator
Grant Number: GW130098 / Pomper, Martin
Supporting Agency: Department of Defense
Grants Officer: Kathy Robinson
Period of Performance: 07/01/2014-06/30/2019 (funding recommended and in negotiation)
Level of Funding: $389,978
Description of Goals: This project concerns measuring two key neurological aspects of Gulf War Illness (GWI), namely, neuroinflammation and dysregulation of muscarinic cholinergic transmission.
Aim 1: To assess the degree of microglial activation in the brains of former Gulf War veterans who suffer from GWI through [11C]DPA-713 PET.

- Jennifer Coughlin

New
Title: Characterizing Altered Levels of Cerebrospinal Fluid (CSF) and Serum Markers in Recent Onset Schizophrenia
Time Commitment: 1.86 Calendar
Supporting Agency: Brain and Behavior Research
Grants Officer: Sho Tin Chen
Performance Period: 01/15/2014-01/14/2016
Level of Funding: $30,000

Description of Goals: The goal is to identify central and peripheral biomarkers present early in the course of schizophrenia.
Aim 1. Characterization of differences in the concentration of "oxidative stress" neurochemical mediators between CSF and serum specimens of drug-naïve patients with recent-onset SZ (defined as within one year of onset of symptoms, n=82) and those of age- and gender-matched HCs (n=82).
Aim 2. Validation of oxidative stress/neuroinflammation in recent-onset SZ by PET- and MRS-based imaging.

Title: Personalized Molecular Neuroimaging of Inflammation in Recently Retired NFL Players
Time Commitment: .96 Calendar
Supporting Agency: General Electric Corp; GE/NF
Grants Officer: unknown
Performance Period: 07/22/2014-01/21/2016
Level of Funding: $300,000
Description of Goals: Measure the degree of microglial activation in recently former NFL players
Aim 1. Measurement of the degree of microglial activation in recently former NFL players with DPA-PET.
Aim 2. Measurement of 5HTT activity in the same subjects as in Aim 1 using DASB-PET.

Title: Extrathalamic nAChR-PET for Imaging Neurodegeneration
Time Commitment: 1.8 Calendar
Supporting Agency: NIH
Grants Officer: unknown
Performance Period: 09/15/2012-05/31/2016
Level of Funding: $249,274 (NCE)
Description of Goals: The goal is to develop a new nicotinic receptor-based PET agent that enables imaging of extrathalamic sites
Aim 1, R21. To develop a method of synthesis of sufficient quantities (100-300 mg) of precursor (-)JHU87571 for radiolabeling of [18F]XTRA for 100 radiosyntheses.
Aim 2, R21. To evaluate [18F]XTRA in mice. (a) To confirm that in vivo [18F]XTRA binds at nAChR selectively and specifically. (b) To show that the radioactive metabolites are not present in the mouse brain. (c) To carry out radiation dosimetry studies in mice for an eIND application.
Aim 3, R21. To characterize [18F]XTRA in baboon PET studies. (a) To confirm that the high nAChR binding potentials in cortex, hippocampus and putamen ($BP \geq 1.1$) and optimally rapid brain kinetics were not unique to the single experiment of the Preliminary studies.

Title: Biomarker and Drug Target Discovery for Subjects with First Episode Psychosis
Time Commitment: 2.4 Calendar
Supporting Agency: Mitsubishi Tanabe Pharma Corporation
Grants Officer: Kaji Takahide
Performance Period: 09/30/2012-09/29/2017
Level of Funding: $1,793,839

Description of Goals: The goal of this study is to identify biomarkers of first episode psychosis, which are specifically associated with novel drug discovery.
Aim 1: to identify biomarkers of first episode psychosis

Title: Direct Test for Neuroinflammation with [11C]DPA-713-PET Scanning
Time Commitment: 2.4 Calendar
Supporting Agency: Department of Defense
Grants Officer: Unknown
Performance Period: 09/29/2014-09/28/2017
Level of Funding: $347,212
Description of Goals: To assess the degree of microglial activation in the brains of former Gulf War veterans who suffer from GWI
Aim 1. To assess the degree of microglial activation in the brains of former Gulf War veterans who suffer from GWI through [11C]DPA-713 PET.

- Yuchuan Wang

New
Title: PSMA Directed Imaging of Prostate Cancer Focus on Androgen Receptor Dynamics
Time Commitments: 1.8 Calendar Months
Supporting Agency: NCI
Grants Contact: unknown
PI: Pomper
Performance Period: 07/14/2015 – 06/30/2018
Level of Funding: $255,280
Description of Goals: The overall goal is to validate at least two positron-emitting, PSMA-targeted imaging agents clinically so that they can be used to full advantage in supporting existing and emerging therapies for a spectrum of patients suffering from PCa.

Title: Direct Test for Neuroinflammation with [11C]DPA-713-PET Scanning
Time Commitments: 2.4 Calendar Months
Supporting Agency/Award Number: DoD W81XWH-13-GWIRP-IIR - GW130098
Grants Contact: unknown
PI: Pomper
Performance Period: 09/29/2014 - 09/28/2017
Level of Funding: $214,328
Description of Goals: This project concerns measuring two key neurological aspects of Gulf War Illness (GWI), namely, neuroinflammation and dysregulation of muscarinic cholinergic transmission.

- **What other organizations were involved as partners?**
  - Nothing to report